

NON-PUBLIC?: N
ACCESSION #: 8909270169
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Point Beach Nuclear Plant PAGE: 1 OF 4

DOCKET NUMBER: 05000301

TITLE: Reactor Trip Resulting from Transformer Sudden Pressure Signal
EVENT DATE: 08/20/89 LER #: 89-004-00 REPORT DATE: 09/19/89

OPERATING MODE: POWER LEVEL:

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: C. W. FAY, Vice President - Nuclear Power

TELEPHONE: 414-221-2811

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: EL COMPONENT: 63P MANUFACTURER: N120
REPORTABLE NPRDS: NO

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On August 20, 1989, at 1631, Unit 2 experienced a main step-up transformer lockout, main generator breaker trip, and concurrent turbine and reactor trips. The unit had been operating at 100% power. The lockout occurred shortly after water spray had been initiated to the transformer oil coolers to reduce temperatures on the X01 transformers. The unit transformer lockout was initiated by the apparently random actuation of the 2X01 "B" phase "sudden pressure" trip system. The unit responded in a normal manner to the trip with several minor problems. An Unusual Event was declared at 1644 due to loss of electrical load. The Unusual Event was terminated at 1856. After extensive investigation and thorough checkout and testing of the 2X02 "B" phase transformer, the unit was returned to service on August 21, 1989.

END OF ABSTRACT

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EVENT DESCRIPTION:

On August 20, 1989, Point Beach Nuclear Plant was operating at full load and observing normal shift routine. At 1631 the Unit 2 reactor tripped following a turbine trip initiated by a generator breaker trip caused by a 2X01 main stepup transformer lockout. The unit lockout was initiated by the actuation of the "sudden pressure" relay on the "B" phase main stepup transformer. The "sudden pressure" relay is intended to protect the transformers from a sudden overpressure in the transformer tank due to internal transformer problems or faults. Just prior to the unit trip, operations had initiated water spray to the transformer oil cooler to reduce the temperature of the 2X01 "B" phase transformer. This evolution is not unusual and frequently is initiated during the warm summer months when the late afternoon sun tends to raise the ambient temperature conditions in the vicinity of the main stepup transformers.

The plant operators performed EOP 0.1, "Reactor Trip Response." The unit responded in a normal manner with several minor plant problems. The automatic fast bus transfer operated as designed and the plant was stabilized before reactor coolant system pressure decreased to the safety injection setpoint. There were no radiation monitoring system (RMS) alarms.

As a result of the loss of electrical load, an Unusual Event was declared at 1644. Notification of offsite agencies was completed at 1657. The NRC was notified of the Unusual Event at 1708. Following a preliminary investigation of the plant trip, plant response, and immediate corrective action, the Unusual Event was terminated at 1856.

Because unit 2 is near end of core life, with a full power primary boron concentration of morning of August 21, 1989 to permit sufficient decay of Xenon to allow a critical approach. During this time the 2X01 "B" phase transformer was thoroughly inspected. Transformer oil was checked and gas samples taken. Fault recorder traces were checked. An inspection of transformer pressure relief devices showed that none had lifted. No damage was evident. The cause of the "sudden pressure" relay actuation could not be identified. The unit was taken critical at 1112 on August 21 and returned to operation later in the day.

System and Equipment Responses:

As stated above, the unit responded very well to the trip transient with only the following problems noted, as reported on the emergency notification system:

1. One of the two installed nuclear instrumentation source range detectors (N32) failed. The detector will be replaced during the fall 1989 Unit 2 refueling and maintenance outage.

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2. A crossover steam dump valve failed to close. This resulted in the loss of condenser vacuum. As a result decay heat removal was accomplished by means of the steam generator atmospheric steam dumps.

Causes and Corrective Actions:

Initiation of water spray to the transformer coolers to enhance transformer cooling has been an accepted practice. The action had not previously caused any indication of abnormal transformer performance. The spray was initiated on only the "B" phase main step up transformer. The 2X01 "B" phase transformer is a single-phase, Class FOA, 19kV to 345kV, shell form - outside assembly transformer manufactured by McGraw Edison. Subsequent to the transient, the transformer was thoroughly tested and examined and no basis for actuation of the "sudden pressure" relay, which consists of an orificed differential pressure switch and associated circuitry, could be identified. The system was reset and the sensor was tested pneumatically as well as electrically, in accordance with the McGraw Edison technical manual. An attempt to vent the oil cooler slowly in order to replicate the events surrounding the trip was made but was unsuccessful in inducing the system actuation. The other two transformer sudden pressure systems were also inspected. Additional examination and testing of this transformer protection circuit will be conducted during the Unit 2 fall 1989 refueling outage. This LER will be supplemented if this examination concludes that the actuation was other than random.

As a precaution against further actuation of this transformer protection circuit resulting in a unit trip, the "sudden pressure" trip for the "B" phase transformer is now disabled whenever unit power is above 25%. Above that power level adequate transformer protection exists via differential relaying. Continuation of this bypass condition will be reevaluated after inspection of the "sudden pressure" device during the Unit 2 outage.

Generic Implications:

There have been no generic implications identified as a result of this event. If our subsequent investigations determine that there were

material or design defects with the transformer or this protection device and circuit, this LER will be supplemented.

Reportability:

This event report is provided pursuant to 10 CFR 50.73(a)(2)(iv), "Any event or condition that resulted in the manual or automatic actuation of any safety feature, including the reactor protection system." As discussed previously, this event also resulted in the declaration of

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an Unusual Event and notifications were made to state and county emergency government and the NRC in accordance with our Emergency Plan Procedures. The system identifier for the "sudden pressure" device is "EL" and this component code is 63P.

Safety Assessment:

The health and safety of the general public, as well as plant employees, was not affected by this event. The Final Safety Analysis Report for the Point Beach Nuclear Plant discusses a loss of external electrical load as one of the analyzed accidents. In that analysis, the assumed initial power level is 102% and no credit is taken for the turbine trip initiating a reactor trip.

Similar Occurrences:

There have been no previous reactor trips initiated by a main stepup transformer "sudden pressure" relay actuation. LER 89-002-00 described a reactor trip resulting from a transformer flashover to ground induced by a fire deluge system actuation. LER 87-002-00 described a reactor trip due to a lightning strike near the Unit 2 stepup transformers.

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Wisconsin Electric POWER COMPANY
231 W. MICHIGAN, P.O. BOX 2046, MILWAUKEE, WI 53201 (414) 221-2345

VPNPD-89-494 10 CFR 50.73
NRC-89-109

September 19, 1989

U. S. NUCLEAR REGULATORY COMMISSION
Document Control Desk Mail Station PI-137

Washington, D. C. 20555

Gentlemen:

DOCKET 50-301
LICENSE EVENT REPORT 89-004-00
TRANSFORMER SUDDEN PRESSURE
SIGNAL RESULTS IN REACTOR TRIP
POINT BEACH NUCLEAR PLANT, UNIT 2

Enclosed is Licensee Event Report 89-004-00 for Point Beach Nuclear Plant, Unit 2. This report is provided in accordance with 10 CFR 50.73(a)(2)(iv), "Any event or condition that resulted in the manual or automatic actuation of any engineered safety system including the reactor protection system."

This report describes a reactor trip which resulted from a main transformer lockout and loss of electrical load caused by an apparently spurious actuation of the "sudden pressure" relay on the "B" phase main step-up transformer.

If any further information is needed, please do not hesitate to contact us.

Very truly yours,

C. W. Fay
Vice President

Nuclear Power

Enclosure

Copies to NRC Regional Administrator, Region III
NRC Resident Inspector

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